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Conidial fungi on *Araucaria angustifolia*: *Trichoconis foliicola* sp. nov. and two new records from Brazil

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Abstract —*Trichoconis foliicola*, a new species found on decaying needle-like leaves of *Araucaria angustifolia*, is described and illustrated. *Trichoconis antillana* and *T. queenslandica* are newly recorded from Brazil. A key to all *Trichoconis* species and illustrations of their conidia are provided.

Key words —hyphomycetes, leaf litter, taxonomy

Introduction

Trichoconis Clem., typified by *T. caudata* (Appel & Strunk) Clem., is characterized by conidiophores that are distinct, colourless, single or branched, with conidiogenous cells that are polyblastic, sympodial, denticulate, and with cylindrical denticles that are separating cells in which rhexolytic secession occurs. The conidia are solitary, fusiform, obclavate, clavate, ellipsoid, subcylindrical, or navicular, rostrate, apical and lateral, septate, and colourless (Deighton & Pirozynski 1972). The genus comprises 21 described species (Index Fungorum 2015; Clements 1909, Pavgi & Singh 1966, Deighton & Pirozynski 1972, Pirozynski 1974, Hawksworth 1980, Hoog & Oorschot 1985, Matsushima 1989, 1993, Castañeda-Ruiz & Kendrick 1991, Castañeda-Ruiz et al. 1997; Baker et al. 2001, Seifert et al. 2011, Brackel 2014). We exclude two *Trichoconis* species from our treatment: *Trichoconis echinophila* (Hoog & Oorschot 1985) is considered to belong in *Pseudotrichoconis* (Baker et al. 2001, Seifert et al. 2011), and *Trichoconis indica* (Pavgi et al. 1966) was described and illustrated as having terminal integrated, unilocal conidiogenous cells, lacking separating cells, and having schizolytic conidial secession, characters that are unquestionably incompatible with the *Trichoconis* generic concept (Seifert et al. 2011).

During research on hyphomycetes occurring on decaying needle-like leaves of *Araucaria angustifolia* (Bertol.) Kuntze (*Araucariaceae*) we noted a unique specimen of *Trichoconis,* which we describe here as new. We also present a synopsis of accepted species and their conidia (Figs 3, 4).

Materials & methods

Samples of decaying needles of *A. angustifolia* were collected, placed in paper bags, transported to the laboratory, washed in tap water, and incubated in moist chambers at 25°C for 30 days (Castañeda-Ruiz 2005). Slide mounts were prepared in PVL (polyvinyl alcohol, lactic acid, and phenol), and micrographs were obtained with an Olympus microscope BX 51 with differential interference contrast (DIC) DP25. Specimens were deposited in the Herbarium (HUEFS).

Taxonomy

Trichoconis foliicola S.S. Silva, Gusmão & R.F. Castañeda, **sp. nov.** Fig. 1

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Differs from all other *Trichoconis* spp. by its narrow obclavate 2-septate conidia with flagelliform and slightly curved to recurved apical cells.

Type: Brazil. Rio Grande do Sul State: São Francisco de Paula, Floresta Nacional de São Francisco de Paula, 29°25′S 50°23′W, alt. 840 m, on decaying needle-like leaves of *Araucaria angustifolia*, 14.V.2014, coll. S.S. Silva (**Holotype**: HUEFS 211338).

Etymology: Latin, *foliicola*, growing on leaves.

Colonies on the natural substrate effuse, hyaline. Mycelium mostly superficial. Hyphae occasionally branched, smooth, hyaline, 2–3 µm wide. Conidiophores distinct, single, erect, straight to slightly flexuous, smooth, 1–2-septate, 9–31 × 2.5–3 µm. Conidiogenous cells mono- or polyblastic, integrated, terminal, cylindrical, hyaline, 8–15 × 2.5 µm, with conspicuous, cylindrical denticles, 2.5–4 µm long. Conidial secession rhexolytic. Conidia narrowly obclavate, rostrate, 2-septate, smooth, dry, hyaline, 25–50 × 2.5–4 µm, rostrum flagelliform, slightly curved to recurved, 15–25 µm long.

Notes: *Trichoconis caudata*, *T. lichenicola* D. Hawksw., and *T. queenslandica* are somewhat similar to *T. foliicola* but are easily differentiated as follows: *T. caudata* conidia are fusiform, mostly 5-septate, and 27–40 × 6.5–12 µm;

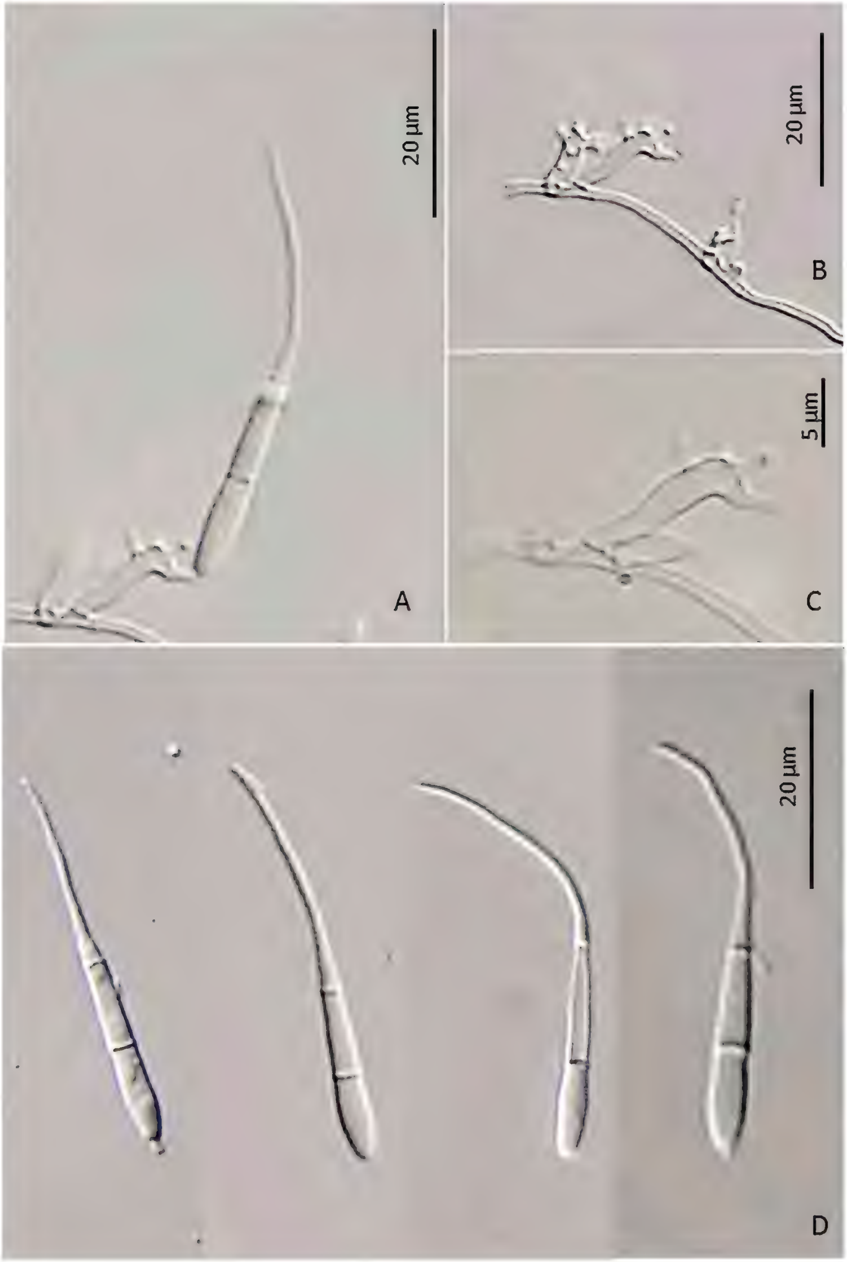


Fig. 1. *Trichoconis foliicola* (HUEFS 211338): A. Conidiophore and conidia. B. Conidiophores reduced to conidiogenous cells. C. Conidiogenous cells. D. Conidia.

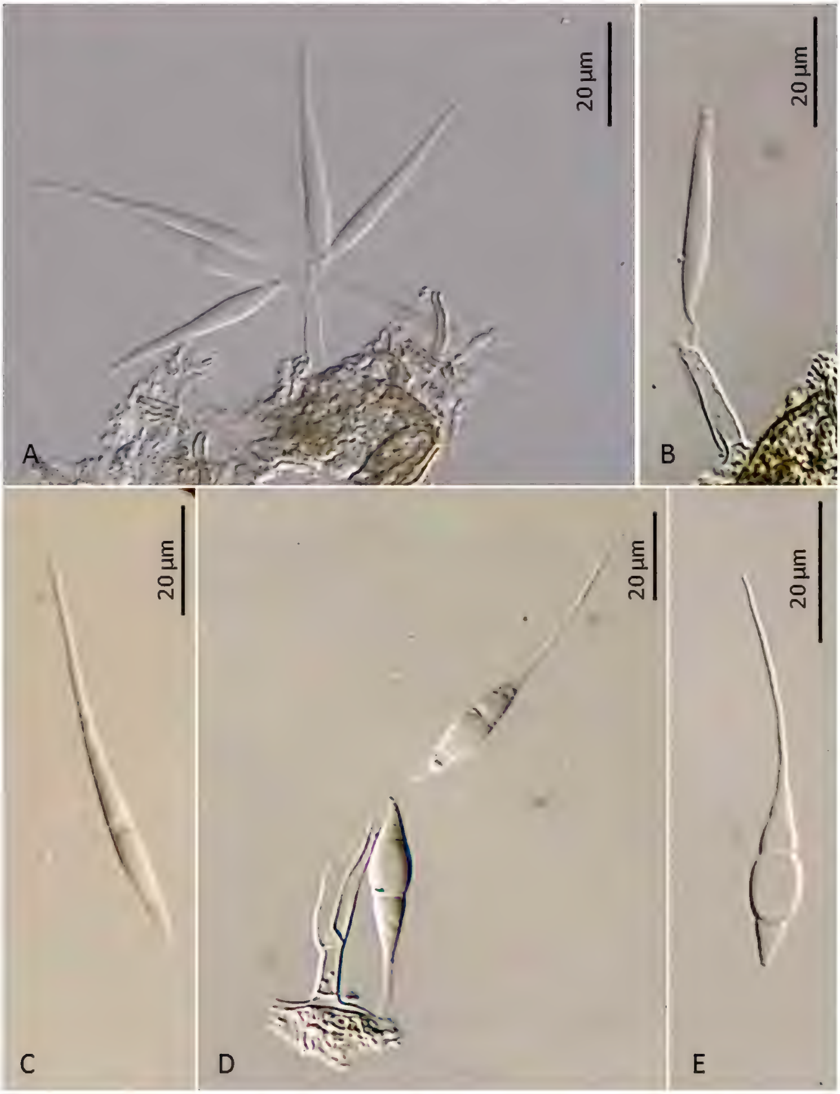


Fig 2. ***Trichoconis antillana*** (HUEFS 211339): A, B. Conidiophore and conidia. C. Conidium. ***T. queenslandica*** (HUEFS 211341): D. Conidiophore and conidia. E. Conidium.

T. lichenicola conidia are fusiform to obclavate, 2–4-septate, and 35–65 × 5.5–7 µm; and *T. queenslandica* conidia are fusiform, mostly 3-septate, and 44–85 × 5–8 µm.

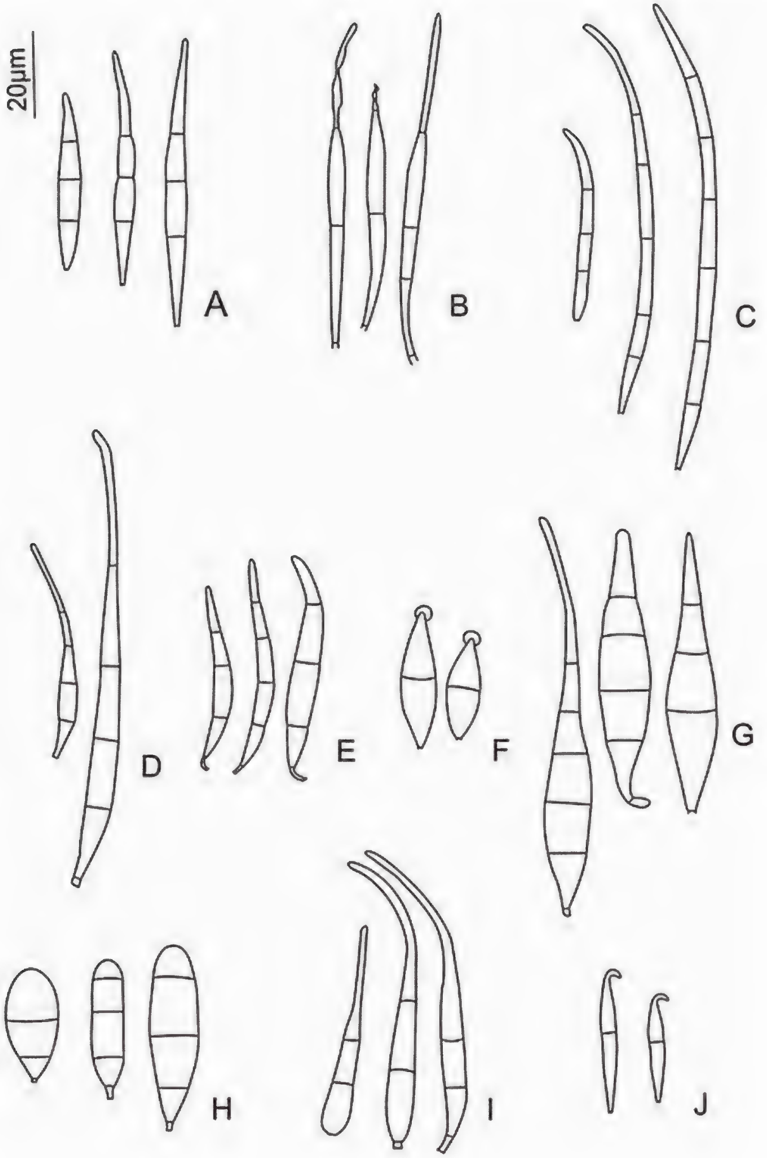
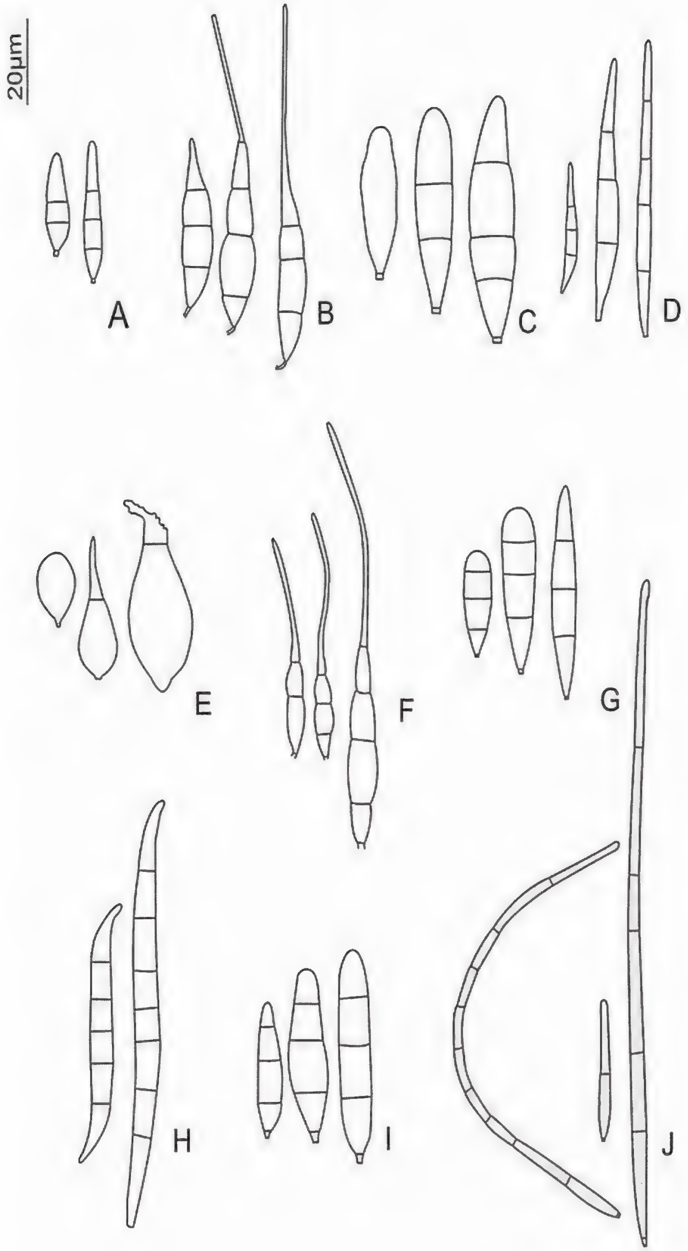


Fig 3. Conidia of *Trichoconis* spp.: A. ***T. africana*** (Deighton & Pirozynski 1972). B. ***T. amazonensis*** (Matsushima 1993). C. ***T. angustispora*** (Deighton & Pirozynski 1972). D. ***T. antillana*** (Castañeda-Ruiz et al. 1997). E. ***T. appendiculata*** (Deighton & Pirozynski 1972). F. ***T. capitata*** (Pirozynski 1974). G. ***T. caudata*** (Deighton & Pirozynski 1972). H. ***T. englerulae*** (Deighton & Pirozynski 1972). I. ***T. foliicola*** (this work). J. ***T. hamata*** (Deighton & Pirozynski 1972).


20µm
A
B
C
D
E
F
G
H
I
J

Trichoconis antillana R.F. Castañeda, W.B. Kendr. & Guarro,
Mycotaxon 65: 103 (1997) FIG. 2A–C

CONIDIOPHORES 20–25 × 3–3.5 µm. CONIDIOGENOUS CELLS 15–20 × 3–4 µm, denticles 4–5 µm long. CONIDIA 45–64 × 3–4 µm.

SPECIMENS EXAMINED: **BRAZIL, SANTA CATARINA STATE:** Urubici, Parque Nacional de São Joaquim, 28°04′S 49°25′W, 990 m alt., on decaying needle-like leaves of *Araucaria angustifolia*, 18.VIII.2014, coll. S.S. Silva (HUEFS 211339). **RIO GRANDE DO SUL STATE:** São Francisco de Paula, Floresta Nacional de São Francisco de Paula, 29°25′S 50°23′W, alt. 840 m, on decaying needle-like leaves of *Araucaria angustifolia*, 14.V.2014, coll. S.S. Silva (HUEFS 211340).

NOTE: A new record for Brazil.

Trichoconis queenslandica Matsush., Matsush. Mycol. Mem. 6: 43 (1989) FIG. 2D–E

CONIDIOPHORES 34–67 × 3–4.5 µm. CONIDIOGENOUS CELLS 19–30 × 3–4.5 µm, denticles 4.5–10 µm long. CONIDIA 42–73 × 4.5–6 µm.

SPECIMEN EXAMINED: **BRAZIL. SANTA CATARINA STATE:** Urubici, Parque Nacional de São Joaquim, 28°04′S 49°25′W, alt. 990 m, on decaying needle-like leaves of *Araucaria angustifolia*, 29.V.2014; coll. S.S. Silva (HUEFS 211341).

NOTE: A new record for Brazil.

Key to *Trichoconis* species

1. Conidiophores and conidia pale olivaceous, obclavate to filiform,
   1–10-septate, 30–200 × 3–4.5 µm .... *T. viridula*
   Conidiophores and conidia colorless 2
2. Conidia with rostrate apical cell 3
   Conidia without rostrate apical cell 9
3. Conidia with hamate rostrum,
   1-septate, 20–30 × 2–3.5 µm, rostrum ≤4 µm .... *T. hamata*
   Conidia without hamate rostrum 4
4. Conidia clavate, 1–2-septate, 36–49 × 2.5–3.5 µm,
   rostrum flagelliform, 17–38 µm long .... *T. amazonensis*
   Conidia not as above 5
5. Conidia 2-septate, obclavate, 25–50 × 2.5–4 µm, rostrum flagelliform,
   15–25 µm long .... *T. foliicola*
   Conidia more than 2 septate 6

FIG 4. Conidia of *Trichoconis* spp.: A. ***T. hibernica*** (Deighton & Pirozynski 1972). B. ***T. lichenicola*** (Hawksworth 1980). C. ***T. malloti*** (Deighton & Pirozynski 1972). D. ***T. pedicephora*** (Castañeda-Ruiz & Kendrick 1991). E. ***T. physciicola*** (Brackel 2014). F. ***T. queenslandica*** (Matsushima 1989). G. *T. schiffnerulae* (Deighton & Pirozynski 1972). H. ***T. sigmoidea*** (Deighton & Pirozynski 1972). I. ***T. trichiliae*** (Deighton & Pirozynski 1972). J. ***T. viridula*** (Deighton & Pirozynski 1972).

6. Conidia 0–3-septate, mostly 3 septa, fusiform, 44–85 × 5–8 μm, rostrum 17–40 μm long .... *T. queenslandica*
   Conidia sometimes more than 3-septate 7
7. Conidia not more than 4-septate 8
   Conidia 3–5-septate, mostly 5-septate, fusiform, 27–40 × 6.5–12 μm, rostrum 9.5–30 μm long .... *T. caudata*
8. Conidia 2–4-septate, 35–65 × 5.5–7 μm, fusiform to obclavate, rostrum up to 30 μm long .... *T. lichenicola*
   Conidia 4-septate, obclavate, 50–120 × 4–6 μm .... *T. antillana*
9. Conidia with not more than one septum 10
   Conidia with more than one septum 11
10. Conidia navicular, with an apical droplet of mucilage, 1-septate, 18–26 × 6–7 μm .... *T. capitata*
    Conidia ellipsoid to suborbicular, 0–1-septate, 10–44 × 7–11μm .... *T. physciicola*
11. Conidia filiform, attenuated at the ends, 3–6-septate, 70–110 × 2.5–4 μm .... *T. angustispora*
    Conidia not filiform 12
12. Conidia with not more than 3 septa 13
    Conidia with more than 3 septa 18
13. Conidial length <40 μm 14
    Conidial length >40 μm 15
14. Conidia 21–30 × 3–4 μm, 2–3-septate .... *T. hibernica*
    Conidia 24–38 × 6.5–9.5 μm, subcylindrical, clavate-ellipsoid or obclavate-ellipsoid, 3-septate .... *T. englerulae*
15. Conidial length <45 μm 16
    Conidial length >45 μm 17
16. Conidia 27–40 × 4–6.5 μm, obclavate to fusiform, 3-septate .... *T. trichiliae*
    Conidia 20–41 × 5–8 μm, obovoid or cylindrical-obovoid, 3-septate .... *T. schiffnerulae*
17. Conidia 20–50 × 5–9 μm, mostly fusiform, 0–3-septate .... *T. malloti*
    Conidia 40–72 × 4.5–7 μm, fusiform, mostly 3-septate .... *T. africana*
18. Conidia with not more than 4 septa 19
    Conidia 3–9-septate (mostly 5–8-septate), fusiform, sigmoid, 50–80 × 5–7 μm .... *T. sigmoidea*
19. Conidia 3–4-septate, fusiform, 43–56 × 4–6 μm .... *T. appendiculata*
    Conidia 2–4-septate, fusiform or obclavate, 20–52 × 3–7 μm .... *T. pedicephora*

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